Transition in Adopting Project Delivery Method with Early Contractor Involvement

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Recently asset owners have been investigating alternative delivery models for construction projects that offer improvements in value for money and project delivery time. One of these methods is the early contractor involvement (ECI) strategy. In this strategy a contractor is engaged before commencement of the construction work to give input during design. After the design, the construction work is negotiated with the contractor. Implementation of this new delivery strategy can raise issues with involved parties in the industry. To find these transitional issues, expectations and opinions were collected from practitioners from the three involved parties—owners, designers, and contractors—who had experience with ECI. The results show that all parties agreed in expecting improvements in quality and innovation and that the costs needed to adopt this system were not significant. Owners and contractors opined that the design phase could be expedited; however, the designers argued that any time savings were negated by increased collaboration and negotiation between the parties. There was also disagreement on risk allocation during construction. Contrary to the other parties, the contractors did not perceive the allocation of risk to them to be greater than with traditional procurement systems. Finally there was disagreement about whether the necessary collaborative culture was present in the construction industry for adopting "open book" costing, often practiced in ECI. It is recommended that for successful implementation of ECI, objectives in the areas of disagreement should be clarified between parties as they work through a transitional phase in adopting the ECI procurement method.

Transit agencies continue to evaluate methods of project delivery for their capital projects that support their increasing drive to achieve value for money (*1*). Public agencies charged with delivering infrastructure, as well as designers and construction contractors, need to adapt to project delivery methods that significantly differ from traditional methods in structure. Emerging project delivery methods rely increasingly on collaboration between the various parties and are aimed at developing longer term positive relationships. Early contractor involvement (ECI) is one of these newer delivery methods. The premise of ECI is that traditional methods create the (construction) team too late in the project development. FHWA estimates that with traditional delivery methods the design is at least 80% constrained when the contractor is involved, leaving little room for innovation and constructability issues (*2*). With the ECI project delivery method the construction contractor is engaged during the early stages of a project to allow the greatest influence on the capital costs and project outcomes as possible (3). The contractor works with the owner to develop the design and a detailed project plan. Once this is completed and risks are better understood, the construction can be finished by the contractor through a negotiated price similar to a guaranteed maximum price contract in U.S. terminology. During the initial stages of a project the owner retains strong input and involvement, but there is no need for the owner to keep a large project team during actual construction. ECI enhances consistency throughout the project by allowing the contractors to stay involved all the way through a project. As a project delivery method, ECI combines principles of alliancing and traditional design-bid-build (DBB) and design-build (DB) methods.

The ECI procurement strategy has been used with high levels of success in the United Kingdom and Australia (*4, 5*). To date, ECI has been used on several infrastructure projects in New Zealand in both the road and the rail sectors; more projects are in various stages of completion, and the New Zealand Transport Agency (NZTA) is looking to further the use of ECI throughout New Zealand. The size of these projects ranges up to approximately $100 million.

As ECI is embraced as a potential new project delivery method, the parties involved in the process are likely to hold different opinions as to how the strategy should operate and what benefits it delivers to them. These different views may in turn create conflicts between the owner, designer, and contractor (*5*). The issues that arise in the use of ECI as a delivery method are likely to do so, for the most part, during the first few projects, which for the purposes of this paper will be considered as transitional projects. This study focuses on the concerns and problems associated with implementing ECI that are held by the various parties involved: the owner, designer, and contractor. Issues relating to implementing ECI project delivery could include disagreement over risk allocation, time constraints, cost reimbursement, as well as level of staff capability and input (*4*). Before presenting the results of a questionnaire shedding light on the different views held by the different parties, the study will present background information on the ECI method as implemented in different countries, New Zealand, Australia, the United Kingdom, and the United States, to illustrate differences in the ECI model as it is being used in the various countries.

BACKGROUND

Worldwide, there has been a trend toward procurement strategies that improve the efficiency and effectiveness of the construction industry. DB has traditionally been used on large, complex projects for the owner to transfer risk (*6*). Arguably, this method does not deliver the best possible design solution because a competitive climate

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draws bidders to lower their price and reduce risk by providing simple solutions (*7*). Kelly et al. recognize that the best way to improve efficiency and effectiveness is by using procurement strategies that are based on negotiation and framework agreements (*8*). Relational contracts such as alliancing have been used as an alternative to traditional methods with the aim of increasing innovation as well as achieving cost and time savings through collaboration. The downside to alliances, however, has been noted as the potential for the owner to lose cost savings through the commonly adopted pain–gain share philosophy, as well as the high demand on owner's management resources during the various stages of a project (*5*).

The ECI delivery method can be viewed as a hybrid of both traditional and relational delivery methods with the intention of including the benefits of both (*5*). ECI aims to support alignment of goals and trust between parties by allowing a greater partnership between them. In contrast to traditional "construct only" style methods, ECI involves the contractor working with the owner in the initial stages of the project to develop the design and a detailed project plan. In parallel, the parties also develop a risk-adjusted price for the delivery phase. Although similar to a design and construct model, ECI has the added benefit that the price is not agreed on until all risks can be assessed. In doing that, risk is shared rationally and equitably throughout a project (*4*).

Tendering for an ECI project is less intensive and less costly than tendering for DBB or DB methods. An ECI project generally calls for two-stage tendering. The first stage aims to select the best contractor to deliver a project and hence does not require the tenderer to prepare detailed cost estimates for the actual construction stage of the work. When the project plans and designs are sufficiently detailed, a negotiated price or separate tendering can take place for the actual construction. In summary ECI aims to achieve value for money for the project sponsor through the following provisions:

- Early engagement of the contractor. Innovative solutions are captured upfront where most savings are made, and extra value is provided by locking in risk management strategies through project planning, design, and construction.
- Selection of a contractor using nonprice criteria. Contractors enter genuine, competitive bids based on resources (capability and capacity), methodology, technology, and productivity benchmarks.
- Agreed risk management. Risks are proactively identified and managed as early as possible in the project cycle.
- Risk-adjusted price. The feasibility study price is risk adjusted by using negotiated risk allocation to determine a negotiated target construction cost.
- Owner's termination for convenience. If the owner is not satisfied with the contractor when entering the construction stage, the contract may be retendered with no second chance for the existing contractor.

ECI has been successfully used in a number of countries across the world, especially on projects that have been deemed as complex in regard to stakeholder involvement and delivery time frame (*4, 5*). The structure of the ECI procurement system varies between countries as well as institutions using the method. Four different systems will be briefly discussed.

South Australian Model

The South Australian Department of Transport, Energy and Infrastructure (DTEI) has successfully used the ECI methodology, which has been structured such that it is broken into two separate phases:

Phase 1. Design development and
Phase 2. Design and construction.

Before Phase 1 is begun, a contractor or a consortium of a contractor and a designer (both will be called "contractor") are selected on the basis of nonprice attributes (*5*). Although a risk-adjusted maximum price based on a 5% ready design can be part of the tender, this is used mostly to gauge understanding of the works. After selection of the contractor, Phase 1 starts and the principles of an alliance contract are followed. The contractor will develop a preliminary design in conjunction with the owner. Compensation for work undertaken in this phase is based on cost reimbursement and is similar to a typical professional services or consultancy contract (*9*). When a preliminary design is approximately 70% complete, the second phase of the project is implemented. Phase 2 involves the negotiation of a price to finish the design development and complete the project in regard to construction (*4*). If no agreement can be reached between the owner and the contractor on the price of works, the owner can terminate the contract and competitively tender the remaining design and the construction. This second phase uses a general conditions contract and resembles a typical DB contract, which requires less input by the owner.

New Zealand Model

In New Zealand, NZTA has completed several infrastructure projects by using the ECI model and several more are in various stages of completion. In other fields of construction, the ECI model has been used more extensively. NZTA has structured the ECI method with three separable portions (SP) as follows:

SP1. Investigation and research;
SP2. Preparation of a detailed design, negotiation of commercial terms (including price), and contract duration; and
SP3. Completion of the detailed design and physical works.

In using this structure, a contractor or consortium is selected by the owner on a non-price basis at the beginning of the project, similar to selection in the Australian DTEI model. However, in contrast to the DTEI model, a fixed price is negotiated for each SP before the start of work. The ECI project delivery method not only displays some major differences compared with the traditional methods that have predominantly been used in New Zealand but also differs from an alliance, particularly in the dynamics of moving between the different phases within a single project. The relationship between the owner and contractor relies on mutual cooperation in SP1 and SP2, but during execution of construction works in SP3, the owner–contractor relationship is comparable to that in a DB project.

U.K. Model

The Highways Agency in the United Kingdom first adopted ECI in 2001 and it is now its preferred procurement route. ECI selects contractors not by lowest price bid because there is not yet a design to bid for, but by an assessment of the company's track record via its capability assessment toolkit. The owner and contractor then